

We claim:

1. A sensor for detecting proteinase enzymes in a fluid
5 comprising:
 - a) a sample reservoir having at least one target antibody and at least one signal element disposed therein, the target antibody bindable to a target proteinase enzyme upon exposure to the fluid to form a target proteinase enzyme target antibody complex; and
 - 10 b) at least one reaction site in fluid communication with the sample reservoir and having a capture antibody bindable to the proteinase enzyme target antibody complex to form a target proteinase enzyme target antibody complex capture antibody conjugate, thereby indicating the presence of the target proteinase enzyme in the at least one
15 reaction site by causing a detectable or measurable manifestation, wherein the target antibody is stationary within the reaction site.
2. The sensor of Claim 1 further comprising a collection area
20 in fluid communication with the at least one reaction site.
3. The sensor of Claim 1 further comprising an absorbent
pad.
4. The sensor of Claim 3 wherein the absorbent pad is
25 positioned within the sample reservoir, the collection area, or a combination thereof.
5. The sensor of Claim 1 further comprising a wick disposed
30 in and extending between the sample reservoir, the at least one reaction site and the collection area.
6. The sensor of Claim 1 wherein the fluid communication is
a channel, a capillary, a wick, or a combination thereof.
- 35 7. The sensor of Claim 1, wherein the at least one reaction site comprises a plurality of reaction sites in liquid communication with the sample reservoir.

8. The sensor of Claim 2, wherein the at least one reaction site comprises a plurality of reaction sites in liquid communication with the collection reservoir.

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9. The sensor of Claim 7, wherein each reaction site has a different capture antibody.

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10. The sensor of Claim 7, wherein the reaction sites are in fluid communication with each other.

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11. The sensor of Claim 1, further comprising at least one particle disposed within the sample reservoir and having at least one target antibody and at least one signal element attached.

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12. The sensor of Claim 11, wherein the particle is polymer, latex, gold, glass, silicon, metal, bacterial or fungal cell, or a combination thereof.

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13. The sensor of Claim 11, wherein the particle is a polystyrene bead.

14. The sensor of Claim 1, wherein the signal element is a colorimetric compound, a radio-active compound, a potentiometric element, a fluorescent compound, a chemo-illuminiscent compound, a light diffracting element, or a combination thereof.

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15. The sensor of Claim 1, further comprising a housing.

16. The sensor of Claim 1, wherein the target proteinase enzyme is a proenzyme or an active enzyme.

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17. The sensor of Claim 1, wherein the target proteinase enzyme is MMP-1, MMP-8, MMP-9, hNE, pro MMP-1, proMMP-8, pro MMP-9, or combinations thereof.

18. A method for detecting the presence of at least one proteinase enzyme in a fluid of a human or an animal comprising:

5 a) providing a sample of the fluid of the human or the animal;

b) exposing the sample to a signal element and at least one target antibody, the at least one target antibody bindable to the at least one proteinase enzyme to form a proteinase enzyme/target antibody complex; and

10 c) exposing the proteinase enzyme/target antibody complex to form a proteinase enzyme/target antibody complex/capture antibody conjugate, to cause a detectable or measurable manifestation of the signal element, thereby indicating the presence of the at least one proteinase enzyme.

15 19. The method of Claim 18, further comprising identifying the at least one proteinase enzyme by determining the presence or absence of a detectable or measurable manifestation of the signal element at a location of the proteinase enzyme/target antibody complex/capture antibody conjugate.

20 20. The method of Claim 18, wherein the at least one target antibody and the signal element are attached to a particle.

25 21. The method of Claim 18, wherein the at least one proteinase enzyme is a proenzyme or an active enzyme.

30 22. The method of Claim 18, wherein the at least one proteinase enzyme is MMP-1, MMP-8, MMP-9, hNE, pro MMP-1, pro MMP-8, pro MMP-9, or combinations thereof.

35 23. The method of Claim 18, wherein the sample is exposed to a plurality of target antibodies, each target antibody being bindable to a different proteinase enzyme; and wherein the presence of a plurality of proteinase enzymes is detected simultaneously.

24. The method of Claim 18, wherein the signal element is a colorimetric compound, a radio-active compound, a potentiometric element, a fluorescent compound, a chemo-illuminiscent compound, a light diffracting element, or a combination thereof.

25. The method of Claim 18, wherein the sample of fluid is taken directly from a wound of the human or animal.

26. A method for treating chronic wounds in a human or an animal comprising:

- a) providing a sample of the fluid of the human or the animal;
- b) exposing the sample to a signal element and at least one target antibody, the at least one target antibody bindable to the at least one proteinase enzyme to form a proteinase enzyme/target antibody complex; and
- c) exposing the proteinase enzyme/target antibody complex to form a proteinase enzyme/target antibody complex/capture antibody conjugate, to cause a detectable or measurable manifestation of the signal element, thereby indicating the presence of the at least one proteinase enzyme.
- d) identifying the at least one proteinase enzyme by determining the presence or absence of a detectable or measurable manifestation of the signal element; and
- e) selecting a treatment for the wound that is effective for treating the identified proteinase enzyme.

27. The method of Claim 26, wherein the treatment for the wound that is effective for treating the identified proteinase enzyme comprises a proteinase enzyme inhibitor bindable specifically to the identified proteinase enzyme.

28. The method of Claim 26, wherein the identified proteinase enzyme is a proenzyme, an active enzyme, or a combination thereof.

29. The method of Claim 26, wherein the proteinase enzyme inhibitor is a proenzyme inhibitor, an active enzyme inhibitor, or a combination thereof.

5 30. The method of Claim 26, wherein a plurality of proteinase enzymes are identified simultaneously and a plurality of proteinase enzymes are treated simultaneously.

10 31. A sensor for detecting proteinase enzymes in a fluid comprising:

a) a sample reservoir having at least one target antibody disposed therein, the target antibody bindable to a target proteinase enzyme upon exposure to the fluid to form a target proteinase enzyme target antibody complex; and

15 b) at least one reaction site in fluid communication with the sample reservoir and having a capture antibody bindable to the proteinase enzyme target antibody complex to form a target proteinase enzyme target antibody complex capture antibody conjugate, thereby indicating the presence of the target proteinase enzyme in the at least one reaction site by causing a detectable or measurable manifestation, wherein
20 the target antibody is stationary within the reaction site.

25 32. The sensor of Claim 31 further comprising a collection area in fluid communication with the at least one reaction site.

33. The sensor of Claim 31 wherein the fluid communication is a channel, a capillary, a wick, or a combination thereof.

30 34. The sensor of Claim 31, wherein the at least one reaction site comprises a plurality of reaction sites in liquid communication with the sample reservoir.

35 35. The sensor of Claim 31, wherein the at least one reaction site comprises a plurality of reaction sites in liquid communication with the collection reservoir.

36. The sensor of Claim 31, wherein the at least one reaction site comprises a plurality of reaction sites, wherein each reaction site has a different capture antibody.

5 37. The sensor of Claim 31, wherein the target proteinase enzyme is a proenzyme or an active enzyme.

10 38. The sensor of Claim 31, wherein the target proteinase enzyme is MMP-1, MMP-8, MMP-9, hNE, pro MMP-1, proMMP-8, pro MMP-9, or combinations thereof.

39. A method for detecting the presence of at least one proteinase enzyme in a fluid of a human or an animal comprising:

15 a) providing a sample of the fluid of the human or the animal;

b) exposing the sample to at least one target antibody, the at least one target antibody bindable to the at least one proteinase enzyme to form a proteinase enzyme/target antibody complex; and

20 c) exposing the proteinase enzyme/target antibody complex to form a proteinase enzyme/target antibody complex/capture antibody conjugate, to cause a detectable or measurable manifestation, thereby indicating the presence of the at least one proteinase enzyme.

25 40. The method of Claim 39, wherein the at least one proteinase enzyme is a proenzyme, an active enzyme, or a combination thereof.

30 41. The method of Claim 39, wherein the at least one proteinase enzyme is MMP-1, MMP-8, MMP-9, hNE, pro MMP-1, pro MMP-8, pro MMP-9, or combinations thereof.

35 42. The method of Claim 39, wherein the sample is exposed to a plurality of target antibodies, each target antibody being bindable to a different proteinase enzyme; and wherein the presence of a plurality of proteinase enzymes is detected simultaneously.

43. A method for treating chronic wounds in a human or an animal comprising:

a) providing a sample of the fluid of the human or the animal;

5 b) exposing the sample to at least one target antibody, the at least one target antibody bindable to the at least one proteinase enzyme to form a proteinase enzyme/target antibody complex; and

10 c) exposing the proteinase enzyme/target antibody complex to form a proteinase enzyme/target antibody complex/capture antibody conjugate, to cause a detectable or measurable manifestation, thereby indicating the presence of the at least one proteinase enzyme.

d) identifying the at least one proteinase enzyme by determining the presence or absence of a detectable or measurable manifestation; and

15 e) selecting a treatment for the wound that is effective for treating the identified proteinase enzyme.

44. The method of Claim 43, wherein the treatment for the wound that is effective for treating the identified proteinase enzyme comprises a proteinase enzyme inhibitor bindable specifically to the identified proteinase enzyme.

45. The method of Claim 43, wherein the identified proteinase enzyme is a proenzyme, an active enzyme, or a combination thereof.